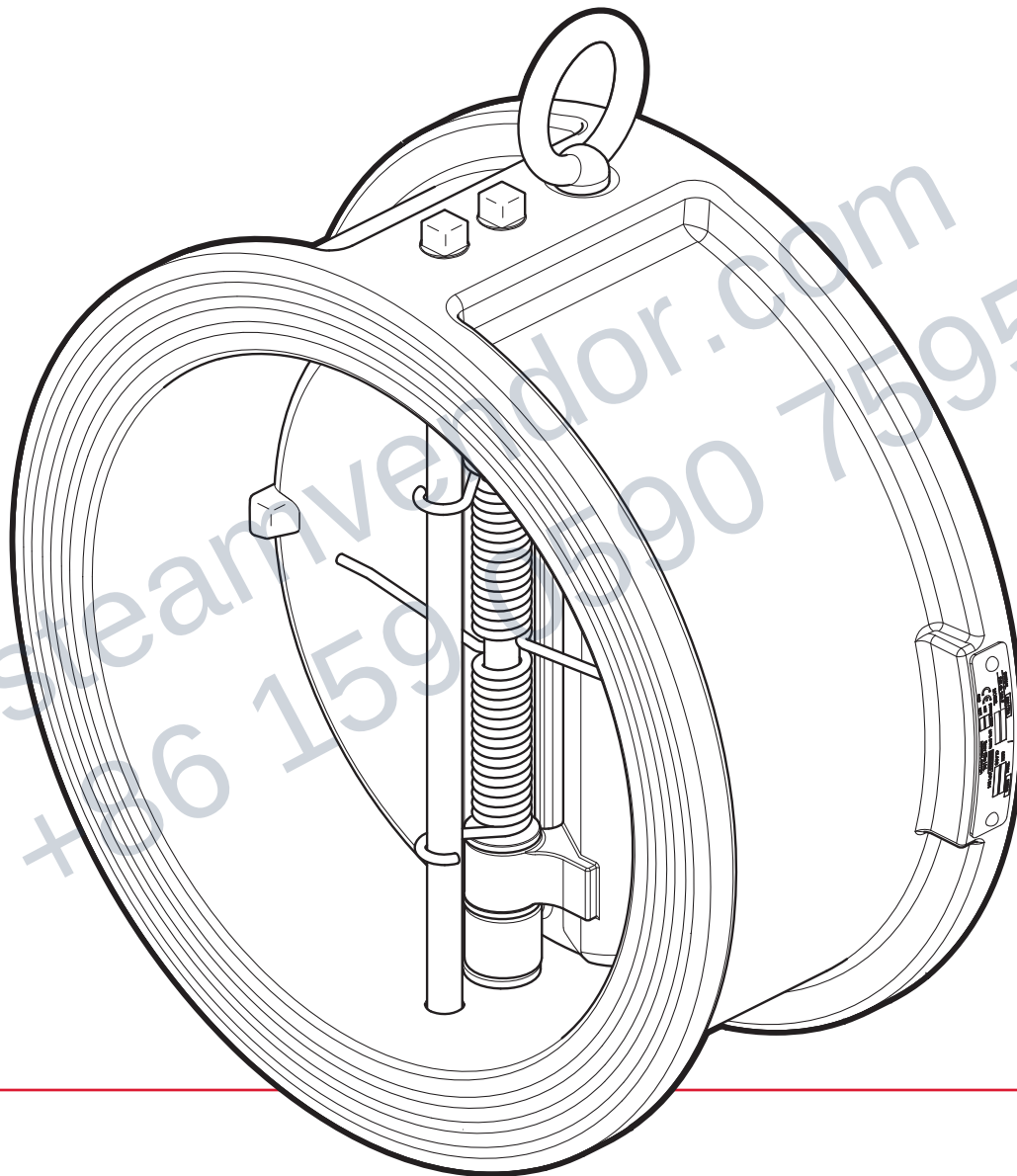


**BRAY/RITE**

# **DUAL DOOR WAFER TYPE CHECK VALVES**

Installation, Operation, and Maintenance Manual



**Bray/Rite**®

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**READ AND FOLLOW THESE INSTRUCTIONS CAREFULLY.  
SAVE THIS MANUAL FOR FUTURE USE.**

## **1.0 DEFINITION OF TERMS**

- 1.1** All information within this manual is relevant to the safe operation and proper care of your Bray valve. Please understand the following examples of information used throughout this manual.

## **X.X IDENTIFIES CHAPTER HEADING**

- X.XX** Identifies and explains sequential procedure to be performed.

**NOTE:** Provides important information related to a procedure.

## **SAFETY STATEMENTS**

The terms DANGER, WARNING, CAUTION, and NOTICE are used in this document to prevent unwanted consequences. Standard symbols and classifications are:



### **DANGER**

Indicates an immediate hazardous situation which, if not avoided, **will** result in death or serious injury and/or property damage.



### **WARNING**

Indicates a potentially hazardous situation which, if not avoided, **could** result in death or serious injury and/or property damage.



### **CAUTION**

Indicates a potentially hazardous situation which, if not avoided, **may** result in minor or moderate injury and/or property damage.



### **NOTICE**

Indicates and provides additional technical information which may not be obvious, even to qualified personnel. The term is not used for personal injury hazards or warnings, but can be used to indicate possible equipment or property damage.

- 1.2** Compliance with other notes — regarding transport, assembly, operation & maintenance, and about technical documentation (e.g., in the operating instructions, product documentation, or on the product itself) — is essential, to avoid faults which can directly or indirectly cause severe personal injury or property damage.

## 2.0 INTRODUCTION



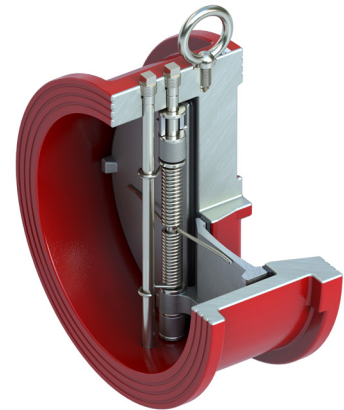
### NOTICE

Failure to follow these procedures could affect product warranty.

**Read and follow these instructions carefully, and keep this manual in a safe place for future use.**

Instructions provided herewith should be thoroughly read and understood prior to actioning any installation or maintenance activities. Bray recommends that only experienced & skilled personnel be allowed to install and maintain these products.

This manual is an overview only & does not in anyway replace the vital functions of on-site, process engineer(s), pipe fitter(s), etc. Please retain this manual in an easily accessible location for any & all employees that may need to reference it routinely.



### 2.2 Valve Selection Confirmation:

A properly functioning valve requires adequate selection review process. Before installation, efforts should be made to ensure valve being offered fits with application requirements by evaluating some common characteristics (non-exhaustive list):

- > Applicable operating conditions (condensation, flow reversal, frequency of operation, pressure drop, throttling, vacuum, etc.).
- > Design and working pressure/temperature requirements.
- > Materials of construction.
- > Pipeline media flow-rate and viscosity.
- > Service media type (abrasive, corrosive, dirty, gas, liquid, etc.).
- > Site location for installation, ensuring adequate distance from sources of turbulence.

**2.3** Modern piping applications demand better features, performance and economy in a check valve.

**2.4** Bray/Rite Features:

- > Cost efficient.
- > Low cracking pressure.
- > Minimal head loss.
- > Quick close.

**2.5** Bray/Rite Performance Characteristics:

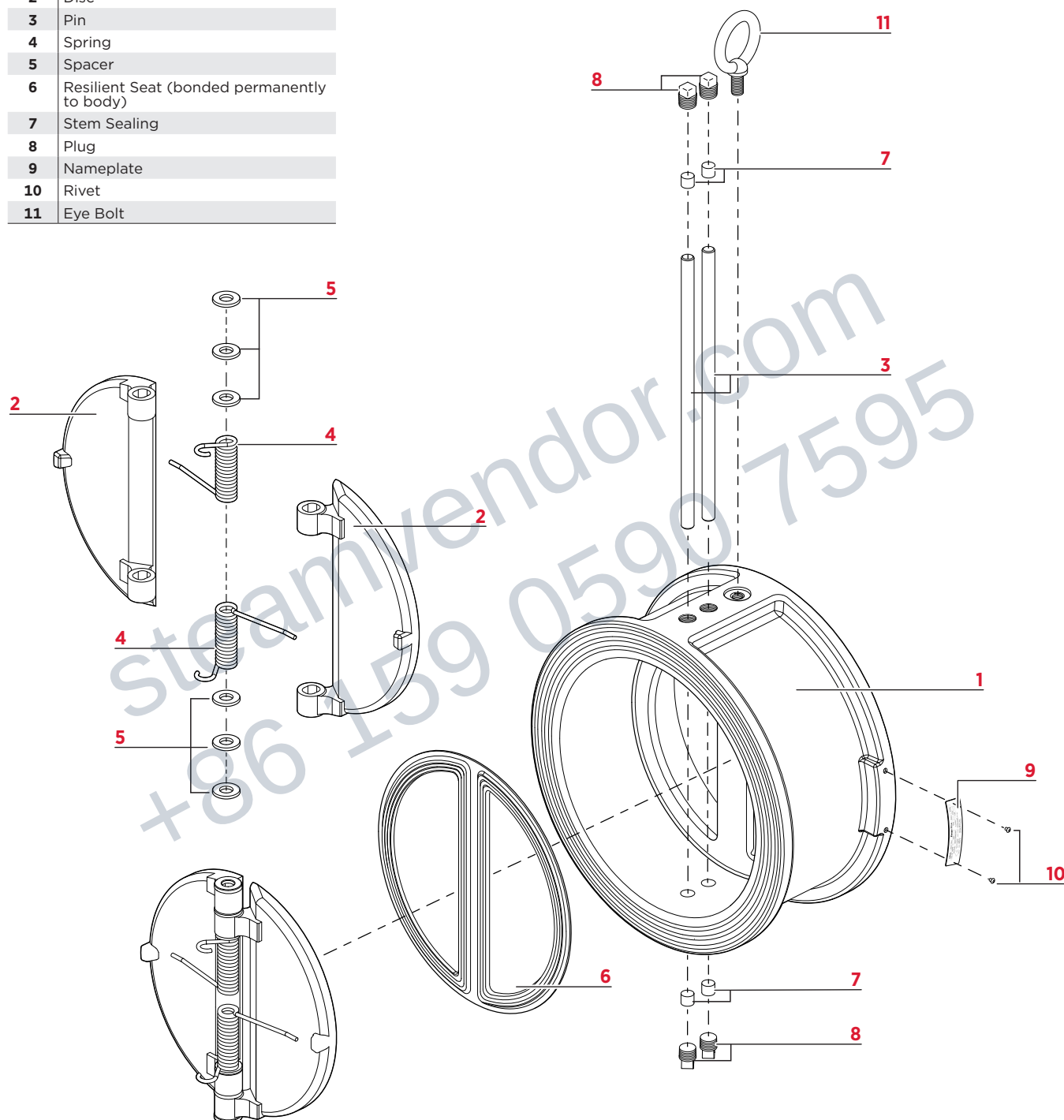
- > Non-slamming.
- > Rapid response.
- > Silent operation.

**2.6** Bray/Rite's combination of these features and performance characteristics ensure long service life of Bray/Rite products.

**2.7** Please refer to separate general arrangement drawings for particular dimensional and operational parameters not appearing in this publication.

### 3.0 PARTS IDENTIFICATION

| ITEM | DESCRIPTION                                 |
|------|---------------------------------------------|
| 1    | Body                                        |
| 2    | Disc                                        |
| 3    | Pin                                         |
| 4    | Spring                                      |
| 5    | Spacer                                      |
| 6    | Resilient Seat (bonded permanently to body) |
| 7    | Stem Sealing                                |
| 8    | Plug                                        |
| 9    | Nameplate                                   |
| 10   | Rivet                                       |
| 11   | Eye Bolt                                    |



#### NOTES:

- > Flange connections meet ASME B16.1 Class 150/BS EN 1092-2, PN10/16.
- > Design: API 594 Class 150.
- > Test: API 598.
- > CE, CE/UKCA, NSF marks available.

## 4.0 VALVE IDENTIFICATION



### NOTICE

- > Ensure the box is not damaged externally.
- > Remove the valve from the packaging and check for any damage to the valve and its components during transit.
- > Report any damage or discrepancies immediately.
- > Every valve has an identification nameplate and must not be removed or covered, so that the installed valve remains identifiable.
- > Depending on the region, the valve identification nameplate may vary.

All valves, actuators, or control products are provided with a nameplate that is unique to each device.

The below nameplate (**Figure 01**) is an example at time of publishing and is subject to change.

All valves shall be marked in accordance with ASME B16.34 and MSS SP25, except in the following conditions:

- > Special Project Valves: as per Engineering designer.
- > Valves designed to different design standard.

**Figure 01**

|              |  |                  |      |         |
|--------------|--|------------------|------|---------|
| SERIAL       |  | Bray/Rite®       | TRIM |         |
| PSI @ 100°F  |  | SIZE             |      |         |
| MODEL        |  | CLASS            |      |         |
| DESIGN TEMP. |  | MFG. DATE        |      | API 594 |
| MIN.         |  | Bray Rite Ltd.   |      |         |
| MAX.         |  | MONTREAL, CANADA |      |         |

0496

## 5.0 QUALIFIED PERSONNEL



### NOTICE

Failure to follow these procedures could affect product warranty.

A **qualified person** in terms of this document is one who is familiar with the installation, commissioning, and operation of the device and who has appropriate qualifications, such as:

- > Is trained in the operation and maintenance of electrical and mechanical equipment and systems in accordance with established safety practices.
- > Is trained or authorized to energize, de-energize, ground, tag, and lock electrical circuits and equipment in accordance with established safety practices.
- > Is trained in the proper use and care of personal protective equipment (PPE) in accordance with established safety practices.
- > In cases where the device is installed in a potentially explosive (hazardous) location — is trained in the commissioning, operation, and maintenance of equipment in hazardous locations.

- 5.1** Additional information about DDCV valves — including application data, engineering specifications, and actuator selection — is available from your local Bray distributor or sales representative.

## 6.0 HANDLING REQUIREMENTS



### WARNING

A potential hazard exists with handling valves. Failure to handle valves properly may cause a valve to shift, slip or fall causing serious injury or death and/or equipment damage.



### CAUTION

Must be taken during handling to avoid this equipment passing over workers, or over any other place where a possible fall could cause injury or damage.

For handling and/or lifting, the lifting equipment (fasteners, hooks, etc.) must be sized and selected while taking into account the product weight indicated in our packing list and/or delivery note. Lifting and handling must be performed only by qualified personnel.

Fasteners must be protected by plastic covers in sharp corner areas.

In all cases, local safety regulations must be respected.

### 6.1 Packed Valves

**Crates:** Lifting and handling of the packed valves in crates will be carried out by a fork lift truck, by means of the appropriate fork hitches.

**Cases:** The lifting of packed valves in cases should be carried out at appropriate lifting points and based on the center of gravity position. The transportation of all packed material must be carried out safely and following the local safety regulations.

### 6.2 Unpacked Valves



### NOTICE

Valve should never be used as pipeline alignment tool. The area where the valve will be installed should have proper spacing afforded by pipeline flanges being mounted on both sides of the space prior to valve install.

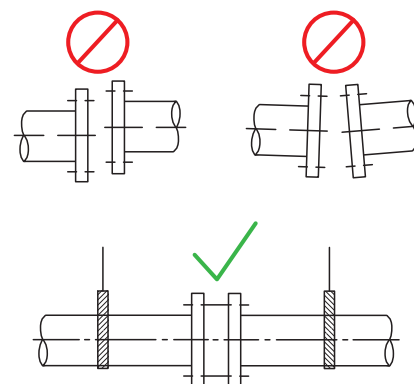
**NEVER** lift or move the valve assembly by means of any attached accessory, internal part, or mounting holes.

Lifting and handling of valves should be carried out by using appropriate means and observing carrying limits. Handling must be carried out on pallets, protecting all machined surfaces to avoid any damage.

With large bore valves, rigging the load must be carried out by using the appropriate tools to prevent the valve from falling or moving during the lifting and handling.

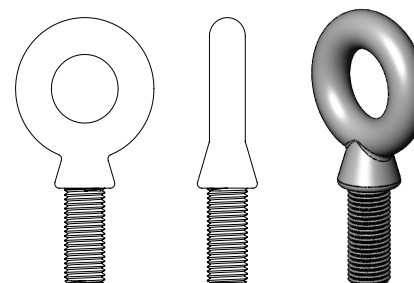
Most standard large (8" and above) check valves are supplied with a removable lifting Eye Bolt (11) (**Figure 03**) which must be used to lift the valve and support the valve during alignment/installation. Improper use will result in valve Body (1) damage.

**Figure 02**



**Support the pipes first for correct alignment**

**Figure 03**





## 7.0 STORAGE



### NOTICE

The packaging is designed to protect the valve only during shipping. If you are not installing the valve immediately after delivery, then you must store it according to these requirements.

Failure to follow these procedures could affect product warranty.

### 7.1 Short-Term Storage

Short-term storage is defined as storage of valves to allow for project construction and will be installed within a relatively short amount of time (typically one to three months). During short-term storage, the following is required:

The preferred storage location is a clean, dry, protected warehouse. Do not expose the valve to temperature extremes.

End protectors shall remain on the valve ends to prevent the entrance of dirt, debris, or insects/wildlife and should only be removed at the time of valve installation.

Goods shall remain in the original shipping container with the original packaging materials. This packaging method will not protect valves that will be stored outside, uncovered, and unprotected.

Storage of valves in an open, uncovered area is permissible, but requires provisions for inclement weather. The product must be elevated from the ground on a pallet, a shelf, or other suitable surface, and must be covered with a secure, waterproof tarp.



### CAUTION

**Do not** stack the valves on top of each other.

Manually actuated valves may be stored in the vertical or horizontal position. For air or hydraulic actuated valves, the preferred orientation is with the valve and cylinder in the vertical position. Access ports should be secured to prevent unauthorized entry and prevent contamination.

### 7.2 Long-Term Storage

**Long-term storage** is defined as storage of valves longer than three months. During long-term storage, the following is required:

The storage location shall be a clean, dry, protected warehouse. Do not expose the valve to temperature extremes.

End protectors shall remain on the valve ends to prevent the entrance of dirt, debris, or insects/wildlife and should only be removed at the time of valve installation.

Product shall remain in the original shipping container with the original packaging materials.



### CAUTION

**Do not** stack the valves on top of each other.

Manually actuated valves may be stored in the vertical or horizontal position. For air or hydraulic actuated valves, the preferred orientation is with the valve and cylinder in the vertical position. Access ports should be secured to prevent unauthorized entry and prevent contamination.

Valves and equipment containing elastomers, including o-rings, must be stored in a climate-controlled warehouse according to SAE-ARP5316D requiring:

- > The ambient relative humidity to be less than 75%.
- > No exposure from direct ultraviolet or sunlight.
- > Protection from ozone generating equipment or combustible gases and vapors.
- > Storage at temperatures below 38°C (100°F), away from direct sources of heat. Preferred temperature range from 4°C to 29°C (40°F to 85°F). If a component is cooled below 15°C (59°F), the entire valve assembly should be allowed to rise above 20°C (68°F) before installing into service.
- > No exposure to ionizing radiation.

## 7.3 Outdoor Storage

Where outdoor storage is a necessity, special crating and valve packaging can be provided, at an additional charge but must be quoted before the order has been placed. Periodic checks on valves in storage are required to ensure all conditions listed above have been met.

Storage of valves in an open, uncovered area is permissible, but requires following of above listed short and long term storage requirements as well as provisions for inclement weather. The product (at minimum) must be elevated off the ground on a pallet, a shelf, or other suitable surface, and must be covered with a secure waterproof tarp.

## 7.4 Storage Inspection

Visual inspection shall be performed on a quarterly basis and results recorded. Inspection, as a minimum, shall include reviewing the following:

- > Packaging.
- > Flange covers.
- > Dryness.
- > Cleanliness.

Valves should be opened and closed once every 3 months.

## 8.0 LIFTING



### **WARNING**

A potential hazard exists with handling valves. Failure to handle valves properly may cause a valve to shift, slip, or fall — causing serious injury or death and/or equipment damage.



### **NOTICE**

Always use safe and proper techniques for lifting and support.

- > Do NOT lift valves with any adjoining pipe or other equipment attached.
- > Follow jurisdictional safety requirements.
- > Lift with properly rated lifting equipment.

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## 9.0 DESCRIPTION

**9.1** Bray/Rite Dual Door Wafer Type Check Valves consist of a compact Body (1) bonded with Resilient Seat (6), and featuring a central mounted internal Pin (3) and Spring (4) system that automatically controls the open/close function of two single plate Discs (2) in the presence of flow.

**9.2** The Discs (2) are mechanically biased to the closed position by Spring (4) system.

**9.3** An Eye Bolt (11) is typically shipped separately (on sizes 8"+ only) in the check valve box from Bray/Rite to avoid damage resulting from transportation to it or the accompanying valve/ packaging. This Eye Bolt (11) can be installed/threaded on the top of the Bray/Rite dual door wafer type check valves.

The Eye Bolt (11) has the primary purpose of aiding alignment during installation. Once successfully installed in proper alignment, The Eye Bolt (11) can be removed after installation if required.

**9.4** The Nameplate located on the valve body specifies:

- > Bray Rite
- > Class
- > Mfg. Date
- > Model
- > Size
- > Temperature (Min/Max)
- > Trim

**9.5** Bray/Rite Dual Door Wafer Type Check Valves are designed to open with minimal crack pressure as per **Table 01**.

**Table 01**

| CRACKING PRESSURE |            |                |            |             |             |             |             |              |              |
|-------------------|------------|----------------|------------|-------------|-------------|-------------|-------------|--------------|--------------|
| Direction Flow    | DN50<br>2" | DN65<br>2 1/2" | DN80<br>3" | DN100<br>4" | DN125<br>5" | DN150<br>6" | DN200<br>8" | DN250<br>10" | DN300<br>12" |
| Vertical          | 0.3        | 0.3            | 0.3        | 0.3         | 0.3         | 0.3         | 0.3         | 1.2          | 1.2          |
| Horizontal        | 0.2        | 0.2            | 0.2        | 0.2         | 0.2         | 0.2         | 0.2         | 1            | 1            |

**9.6** Bray/Rite Dual Door Wafer Type Check Valves are normally installed with the Eyebolt (11) (**Figure 03 pg. 8**) pointing vertically upwards in a horizontal run of pipe, with the arrow on the Body pointing in the direction of flow.

**9.7** All Bray/Rite Dual Door Wafer Type Check Valves are hydrostatically tested in accordance with ANSI B16.34, and API 598 test procedures.

## 10.0 INSPECTION & UNPACKING



### NOTICE

Care should be given to inspect the product packaging for damage on all goods received while the freight carrier is still present. **Any observed packaging damage should be reported immediately to the carrier**, & any claim requirements followed through.

### 10.1 Unpacking

Open the shipping container with adequate care ensuring to leave containers intact.

Any/all externally listed container specific markings must be followed.

Remove any packing material and carefully lift the product(s) from the container.

All shipping container and packing materials provided should be used (when space permits to do so) for product storage.



### NOTICE

Care must be given to do a thorough visual inspection of all goods received in a timely manner. Any damage, or missing components expected where the expectation relates to mishandling during transit, should be noted to carrier immediately.

Items that are damaged during shipment fall under the liability involved with quoted incoterms. If damage is observed, file a claim with the freight carrier immediately. Refer to Bray Terms and Conditions for Sale for our full warranty policy.

### 10.2 Preparation for Shipment

Bray/Rite valves are normally shipped from the factory in a combination of boxes, crates, or on skids (size & model dependent).

Product packaging (when customer intends to re-ship goods to an additional location) must be completed in a manner to protect against deterioration and physical damage during transit and storage.

Any protruding accessories, deemed to be at heightened risk to damage by their design (i.e. Eye Bolts (11)) may, if required for safekeeping, be removed & packaged separately.

All customer-driven packing requirements, must be clearly called out and quoted separately prior to placing the purchase order.

**Any/all special shipping conditions must be reviewed by Bray/Rite for compliance at time of quotation, & be clearly defined in writing. Such instructions also need to be of a quality standard such that they adequately protect to (a.) goods during transport, & (b.) goods during site storage requirements.**

## 11.0 TOOLS REQUIRED

Lifting equipment, wrench.



### NOTICE

Personal protective equipment such as eye/foot/hand protection is required when installing or maintaining wafer check valves.



### CAUTION

Please use caution. Preset spring(s) have capacity to cause serious injury when tension is released.

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## 12.0 INSTALLATION CONSIDERATIONS

Lifting equipment, wrench.



### NOTICE

Location for valve should be selected based on distance from turbulent conditions.

- > Media flowing to valve should be filtered first to remove unwanted debris.
- > Non-compliance can effect check valve sealing, and adversely effect optimal performance.
- > Valve materials must be compatible with line media it will experience.
- > Valve pressure/temperature limits must align with the application requirements.

Before installation, all valves must be checked for any/all foreign materials that may have become entrapped during storage/transportation. All contaminants should be removed with solvent dampened cloths.

Sealing surfaces should be inspected to ensure there is no damage (cuts or nicks) & that general appearance is clean and smooth.

Check Valves must be placed a distance 6 to 10 pipe diameters away from any/all source of turbulence such as elbows, expansions, pumps, reductions, swages, tees, etc) and in an area easily serviced.



### CAUTION

Standard check valves are typically designed for steady flow conditions, and not for use in physical/thermal shock-load applications (via reciprocating pump, compressor). In this type of application, standard check valve will not perform efficiently and have a greater tendency to fail.

Install all flangeless wafer valves between two pipe flanges with gaskets on the contact faces (of the same series as the valve), centered in line by the surrounding flange bolts, and tightened as per industry standard practice.

All internal parts designed to move should operate freely.

The normal installation of a Bray/Rite Dual Door Wafer Type Check Valves should be as per **Figure 04 pg. 16** pending horizontal or vertical flow applications.

When removing a Bray/Rite Dual Door Wafer Type Check Valve from the line, only one half of the studs need to be removed and the others loosened.



## NOTICE

1. Double check the flow direction arrow on the body is matching intended flow direction before inserting the Bray/Rite Dual Door Wafer Type Check valve between the flanges.
2. Pipeline flanges must be parallel and have the same pressure class rating as the valve.
3. There must be no obstructions in the mating flange(s), or pipe bore(s) as this would prevent the valve from opening fully, potentially leading to premature valve failure.

Any provided valve protection accessories such as wooden plates or plastic caps should not be removed until the valves are ready to be installed, so as to keep foreign contaminants out.

## 12.1 Final Preparations

Remove the plastic flange protectors (if present) and other packaging materials from the Check Valve.



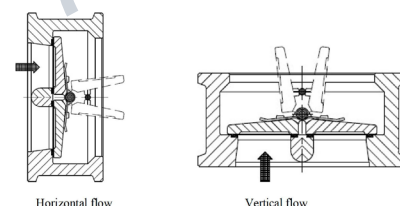
## CAUTION

For vertical down-flow installations, consult Bray/Rite technical team for custom solutions that may be available.

Orient the valve such that the flow arrow (cast/etched onto body or printed on the nameplate) points in the direction of the desired pipeline flow. Be aware that Discs (2) in open valve position extends beyond face-to-face dimension, and so needs to be installed to avoid contact with pipe end, gasket, or other valve which should not be directly connected.

The appropriate material handling equipment must be used in order to prevent injury and possible damage to the check valve and personnel responsible for installation.

**Figure 04**





## 13.0 INSTALLATION PROCEDURE

Use jack-up bolts if required to maintain the required Space of 6 to 10 mm wider than the face to face dimension of the valve.

Set two bolts into the lower side of the pipe flanges without tightening them, then install the valve between the flanges carefully. Install the gaskets (procured separately) onto both sides and set two bolts into the upper side of the pipe flanges.

Tighten four of the upper and bottom bolts to temporarily align the pipes and the valve accurately.

Tighten all other bolts through the holes of the pipe flanges.

Tighten the bolts evenly, gradually and alternately in a pattern as shown in **Figure 05**. The ends of all tightened bolts shall be evaluated for equal protrusion beyond the nuts. Run a pilot operation to gradually raise the line temperature and pressure. Retighten the threaded portions as required.



### CAUTION

**Operation Start-Up:** After the installation has been verified (at start-up, & after shut-down conditions) as safe and complete, it is important for operators to start the pipe system flow gradually. The goal is to not stress the check valve (and other line equipment) via sudden shock.

### Note:

Bray Rite is issuing these recommendations only as a guide to installation. This recommendation is based on the full compliance of all materials supplied to their appropriate specifications. Since many of the components are not manufactured by Bray we can take no responsibility for any damage caused during installation.

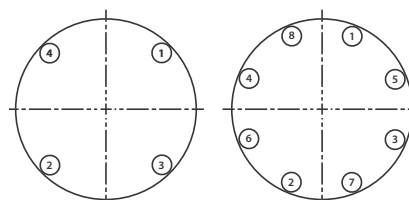
**Table 02**

| RECOMMENDED FLANGE TORQUES |           |               |    |                     |      |
|----------------------------|-----------|---------------|----|---------------------|------|
| Flange Size Range          |           | Fastener Size |    | Recommended Torque* |      |
| In                         | mm        | In            | mm | lb ft               | Nm   |
| 2" - 4"                    | 50-100    | 5/8           | 16 | 35                  | 50   |
| 5" - 8"                    | 125-200   | 3/4           | 19 | 45                  | 60   |
| 10" - 12"                  | 250-300   | 7/8           | 22 | 75                  | 100  |
| 14" - 16"                  | 350-400   | 1             | 25 | 110                 | 150  |
| 18" - 20"                  | 450-500   | 1 1/8         | 29 | 200                 | 270  |
| 22" - 30"                  | 550-750   | 1 1/4         | 32 | 250                 | 340  |
| 32" - 48"                  | 800-1200  | 1 1/2         | 38 | 430                 | 585  |
| 52" - 72"                  | 1300-1800 | 1 3/4         | 45 | 715                 | 970  |
| 84"                        | 2200      | 2             | 51 | 1175                | 1595 |
| 90" - 96"                  | 2250-2400 | 2 1/4         | 57 | 1675                | 2270 |

\* Assumes well lubricated fastener selected to a grade sufficiently strong for the corresponding torque rating. Torque value is a general recommendation. Specific applications may require additional torque on flange fastener. Do not exceed 110% of recommended value.

**Figure 05**

### 4 Bolt and 8 Bolt Flanges



- Lubricate, hand tighten, then SNUG up bolts
- **Round 1** - Tighten to 25% of final torque
- **Round 2** - Tighten to 50% of final torque
- **Round 3** - Tighten to 100% of final torque

## **14.0 DISASSEMBLY/REASSEMBLY**

The simple design of the Bray/Rite Dual Door Wafer Type Check Valves valve is designed to be a no-maintenance design and repair kits are not available.

Dis-assembly/Re-assembly is not recommended. Consult factory engineering staff for technical support.

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## 15.0 MAINTENANCE

### Valve Removal for Inspection



#### **DANGER**

Before removing any check valve from the pipeline, ensure the media flowing in the pipeline is confirmed and any/all special handling protocols are followed/understood. Always review the applicable Material Safety Data Sheet (MSDS) for the media in advance of work performed.

Before removing any check valve from the pipeline, the vessel pressure must be reduced to atmospheric by means of suction/venting/other. Failure to do so may result in serious bodily injury.

Shutting off the upstream pump acts to isolate the check valve.

Close the downstream isolation valve.

Drain the system section featuring the check valve as much as possible.

Vent the line on both sides of the check valve to relieve pressure from the check valve. **Always loosen the outlet side first.**

Once pressure has been relieved successfully, move to loosen the inlet side.

Remove check valve from the pipeline, inspecting internals for signs of damage, & degradation.

If replacement valves are required, use exact valve nameplate & drawing procured to identify part numbers required for replacement. Alternatively, please contact Bray/Rite for technical support.

## **16.0 REPAIRS**

### **16.1 Leakage Conditions**

A schedule for routine inspection should be implemented and performed.



#### **NOTICE**

If leakage is identified during maintenance, check the flange gasket and flange bolt torque to ensure they are within acceptable limits. Valve removal for inspection may be required. See above notes.

Any re-tightening should be even, gradual, & completed alternately in pattern as indicated in **Figure 05** on pg. 17.

### **16.2 Minimal Flow**

While flow is halted, verify flow direction arrow is installed in correct alignment with required direction of flow.

### **16.3 Slam Conditions**

Initiate valve removal to inspect spring condition and tension. For any persisting problems, consult Bray/Rite engineering staff to see if your application may require the premium Single Door Wafer Type Check Valves that are sized & accessorized (where necessary) to meet application requirements.

### **16.4 Vibration Conditions**

When valves are found to be vibrating excessively, firstly verify that flow rate is within acceptable ranges.

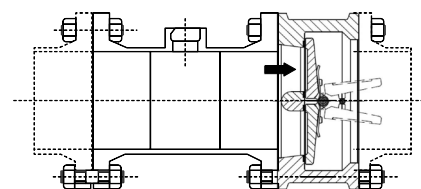
Verify site installation location has at least 6 to 10 pipe diameters length from any source of turbulence (ie. elbows, expansions, pumps, reductions, swages, tees, etc.).

When visible damage is observed on the bonded Resilient Seat (6) (or other internal parts), a replacement valve is necessary.

## 17.0 SPOOL INSTALLATION

When a standard flanged valve is replaced with a shorter face-to-face wafer valve model, a spool piece (**Figure 06**) can be inserted with the Bray/Rite Dual Door Wafer Type Check Valves valve to obtain the required face to face dimension. The installation instructions above apply.

**Figure 06**



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## 18.0 SAFETY WARNINGS

- 18.1** The valve must be installed in the correct line size between flanges of the correct class.

The valve materials of construction must be compatible with the media being handled.

Pressures and temperatures must be kept within the limits specified by the appropriate ASME standard, ie: B16.1, B16.34, B16.42, API 594, or within the limits specified by the particular design.

An arrow on the body indicates the direction of flow through the valve. The valve must be installed with the arrow pointing in the correct direction.

For flow in the horizontal direction, the valve shall be installed with the Pin (3) in the vertical position with the Eye Bolt (11) pointing vertically upwards.

The valve must be installed in the correct location in the pipeline. The Discs (2) must not open into or against other piping components such as valves, elbows, or tees. For the best performance and to extend/maximize life of the valve, a minimum of 6-10 pipe diameters of straight pipe upstream of the valve is suggested. Any reduction in this length upstream of the valve reduces the life of the valve proportionally.

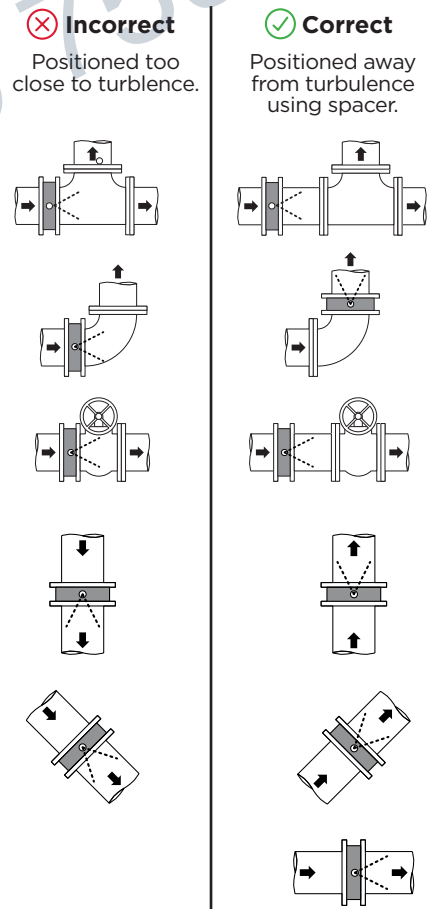
The Plugs (8) must not be removed from the valve while the pipeline is under pressure.

Flow rates must be within the acceptable limits. Excessively high flow rates may cause extreme pressure drops and erosion of the components. Excessively low flow rates may cause the Disc (2) assembly to oscillate and cause wear which may lead to premature failure of the internals.

Care should be taken in handling the valve. Mishandling may lead to damage of the sealing components or damage to the externals.

- 18.2** Take care to ensure dangerous media is handled according to your company site safety protocol.

**Figure 07**



## **19.0 LIMITATIONS AND PRECAUTIONS**

Accurate sizing is crucial to ensure an acceptable pressure drop, and a resulting long service life. Bray/Rite Dual Door Wafer Type check valves are NOT recommended for the following service conditions:

- > Installed directly on to a Butterfly valve (or other piping accessory) that may interfere with the opening or closing of Disc (2) components.
- > Pulsating flow conditions.
- > Service condition requiring a “Full Port” opening.
- > Solid handling.
- > Severe services.
- > Vertical down flow.

**See Bray Terms and Conditions provided with quotation for complete warranty details.**

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## 20.0 TROUBLESHOOTING

| SYMPTOM                                                       | POSSIBLE CAUSE                                                                                                                                                                                                                            | RECOMMENDED SOLUTION                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Abnormal Noise</b>                                         | The Disc (2) (a.) hits the Pin (3) when in the open position due to turbulent flow of the line media, or (b.) the Disc (2) chatters by contacting the bonded Resilient Seat (6) as a result of low flow velocity water hammer phenomenon. | Tighten the flange bolts and nuts evenly, gradually, and alternately in pattern shown on <b>Figure 05</b> pg. 17. When any abnormal noise is found, consult with Bray/Rite Engineering staff immediately who may further assess the condition of primary components such as the Disc (2), Pin (3), and Spring (4) prior to disassembly, which is discouraged. |
| <b>Leakage detected from Flange Area</b>                      | Loose or uneven torque of flange bolts and nuts.                                                                                                                                                                                          | Tighten the flange bolts and nuts evenly, gradually, and alternately in pattern shown on <b>Figure 05</b> pg. 17.                                                                                                                                                                                                                                             |
| <b>Leakage detected from Gasket Area (in closed position)</b> | Resilient Seat damage or deformation.                                                                                                                                                                                                     | Tighten the flange bolts and nuts evenly, gradually, and alternately in pattern shown on <b>Figure 05</b> pg. 17. Consult piping engineer regarding potential external stress.<br><br><b>Note:</b> Spare Resilient Seat parts are not available as this is a bonded design, so full valve replacement is likely required.                                     |



### NOTICE

The DDCV is not in-field repairable. For further troubleshooting and repair options and information, please contact your local Bray representative.



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